Kabi cultivation is permitted on *kachas* only to make use of the land and to realise revenue from it while it is unfit for forest. Kharif crops are grown with the object of sowing up blanks with seedlings raised with the cereals cultivated, but up to the present little, if any, success has been achieved by reason of the fruitless efforts made to establish babul, where it was sylviculturally impossible to do so. From 1895 to 1898 a sum of Rs. 3,102 was expended on a scheme of growing and irrigating babul in Kot Sultan forest: over 2,000 acres of land were put under cereal crops and babul seed was sowed along with the grain. For irrigation 6 sluices were opened in the Sher wah which runs along the south-east boundary of the forest. Everything promised well for a time; the seedlings raised grew, in some instances, to a height of 10 to 12 feet and more; but after 1897, the river running low for three years in succession, the wah failed to respond to the needs of the young babul with the result that frost killed off the plants by thousands in each winter and the land that was cultivated is no further advanced in forest-growth than it was before cultivation was done. Experiments of this sort have been tried often enough now to convince the most sanguine theorist of the utter futility of attempting to grow babul under any artificial system which is not sylviculturally suited to it; and that it is best left to develop itself naturally on the banks of the river where it can and will succeed. The only artificial aid necessary on the *kachas* is protection against browsers and fire. On the other hand blanks can be restocked with *kandi* with the aid of cereal crops. In 1899, Mr. Betham, then Conservator, put a stop to kharif crops to a very large extent because he was of opinion that they did no good (*vide* paragraph 96, Forest Administration Report for 1899-1900). Without advocating the plan of converting all dry forest land into areas growing field crops for purpose of reboisement, it may be said that much may be done in this way to keep up the reproductive power of the soil when other means are not likely to succeed. It is rather the result of bad management than the fault of the cultivator if he is able to go off with an ample yield of grain for himself without benefiting the forest in the way which it was intended that he should.

55. Other special works of improvement undertaken include the opening of flood-ways in the Sukkur, Kashmor and Jhāli bands, and the cutting and clearing of karias or irrigating channels in several forests. Two small bands have been erected on the southern boundaries of Kadrapur and Moro-Mari forests to check the out-flow and to raise the irrigating level of water coming into those forests. Without going expensively into works of this sort, it would be advisable to continue them, especially with a view to improving the irrigation of a forest. Of course the needs of any particular forest must be carefully observed during the season of inundation of the river and advantage ought to be taken of any exceptional overflow to irrigate those areas which are normally dry.

3.—*Past revenue and expenditure.*

56. Appendix H gives the revenue and expenditure of the past 10 years. The average annual gross receipts were Rs. 1,50,147 and the average annual expenditure was Rs. 69,715 giving a net annual income of Rs. 80,432. The change under budget head I of both revenue and expenditure from the year 1895-96 is due to the exploitation of timber and firewood having been done by contract in place of departmental agency from that year.

CHAPTER IV.

Utilisation of the produce.

1.—*Marketable products: requirements to be met.*

57. The marketable products are firewood, timber and minor produce, including grazing. Appendix I exhibits the actual quantities of produce removed annually during the past 10 years. The most important product is firewood and upon the out-turn of it the revenue of the division depends. Both babul and *bahan* yield timber, and *lai* rafters are in use, but, on the

whole the supply of timber is limited. A small quantity of charcoal is manufactured from babul wood in forests close to Sukkur. Grazing is the most important item of minor produce.

58. The quantities of fuel shown in appendix I do not represent the quantities exploited from forest only, but include also wood cut in revenue lands and supplied to the railway as well as to the local markets through ghats. The following statement shows the distribution of fuel to the North-Western Railway and to other public bodies during the above period :—

Public body.	1892-93.	1893-94.	1894-95.	1895-96.	1896-97.	1897-98.	1898-99.	1899-00.	1900-01.	1901-02.
	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.
North-Western Railway ...	3,421,400	2,771,030	2,593,835	4,682,145	2,939,775	2,552,456	4,937,600	3,630,025	3,592,810	4,832,890
Indus Ferry Steamer ...	77,950	114,000	97,695	109,100	31,700	...	64,670	91,570	97,625	...
River Conservancy... ...	4,000	2,500	1,500	1,150	...	425	2,770	3,585	3,310	2,615
Commissioner's Steamer ...	17,625	18,225	14,100	23,715	11,475	11,660	19,070	6,215	16,450	15,125
Sukkur Municipality ...	52,000	33,475	55,535	950	...	...	24,035	...	...	...
Commissariat, Quetta ...	704,925	927,410	216,910	304,895	...	...	...	...	...	...
Sukkur Water Works ...	...	3,000	31,675	...	...	...	...	...	...	...
Adjutant, R. A., Quetta ...	...	4,695	4,825	...	...	...	...	...	...	...
E. E. Military Works, Quetta...	...	11,035	30,150	...	...	...	...	...	...	...
Total ...	4,276,900	3,888,360	3,049,135	5,121,955	2,982,950	2,564,540	5,048,205	3,731,375	3,790,995	4,850,660

The difference between the totals in the foregoing statement and those exhibited for fuel in appendix I are taken to represent the quantities exploited from both forest and revenue lands through the agency of the ghats.

2.—*Lines of export.*

59. The river Indus is the only line of export for produce of riverside forests carried to Sukkur; and the compartment lines cleared in the forests give easy access to its banks. Dhands navigable by boats when the river is [redacted]ood are used for forests through which they flow to connect with the river; [redacted]art-ways, both built and rough, lead to railway stations where the [redacted]ce is delivered. The boats used for the carriage of the produce on the [redacted]are of the ordinary flat bottomed type usually seen on the Indus.

3.—*Centres of consumption.*

60. Sukkur, Rohri and Shikarpur are the principal markets for the timber produce of the forests. These towns likewise consume large quantities of firewood from lands both in and out of forest. The North-Western Railway, however, is the most important customer of the Forest department, in so far that it has to be the first served with firewood for locomotive use. This is done by the agency of contractors who purchase the annual coupes, and who are under agreement with the department to supply firewood to the railway at rates previously agreed upon with the management. (For rates, see appendix F.) The size of the billets must be $2\frac{1}{2}$ ft. in length and from 7″ to 30″ in girth, and the wood is taken to the railway stations where it is stacked and delivered in lots of $40' \times 5' \times 5'$

61. The bulk of the firewood consumed locally in the market towns is brought on permits issued on payment of fees at ghats established for the purpose. Fees varying according to the description of the load are levied on wood brought from both forest and Government waste lands. Needless to say that this irregular system of exploiting forests is a pernicious one in that it encourages the illicit manufacture of dead wood from standing trees; it is inconsistent with proper forest conservancy and the improvement of the forests and ought to have no place in well managed forests. The expediency or otherwise of keeping up ghats for waste land wood is a matter for the Administration to determine, but it may be added that departmental working of ghats is at all times an unsatisfactory one in the absence of constant superior supervision. Probably, a better way of exploiting Government waste land produce would be to annually farm out the right to collect the revenue of the ghats, the whole being supervised by the Forest department. It would be better still, however, to afforest Government waste lands which are fit for forest, and to hand over to the Forest department for felling and clearing annually those which are not, and which are proposed to be given out for cultivation and to permanently close the ghats.

62. The following shows the foreign imports of wood into Sukkur from Bahawalpur and Khairpur States and the Panjab during the last 5 years:—

	Bahawalpur.	Khairpur.	Panjab.
Bahan timber	No. 10,468	No. 1,080	No. 60
Do. rafters	„ 83,486	„ 1,235	„ 52,294
Tali timber	...	„ 85	„ 320
Do. rafters	...	„ 25	„ 2,267
Lai rafters	...	„ 600	...
Firewood	204,760 c. ft.	67,485 c. ft.	...
Charcoal	...	22,018 mds.	...
Babul planks	...	...	42

Deodar in logs is also imported into Sukkur from the Panjab and used in carpentry and building, but there is no record of the quantities that have come in.

4.—Mode and cost of extraction.

63. The produce of the coupes is extracted by the contractors to whom it is sold and who bear all the expenses incidental to the felling and the conversion of the material, and its carriage to the market or railway station. Tenders are annually invited for the purchase of the coupes, and a lease of one year beginning from 1st October is granted for felling and removing the material after which the areas are closed for reproduction. The produce is conveyed to the banks of the river or to a railway station, distant from 0 to 10 miles on carts, camels and donkeys.

64. The cost of extraction and the rate for conveyance of timber, firewood and charcoal are quoted below. They vary considerably in different forests according to the lead and the facilities or otherwise of carriage.

(1) Timber—			
Felling and conversion	per 1,000 c. ft.	...	Rs. 6¼
Carriage to river bank	do.	... from Rs. 3 to	„ 5
Boating to Sukkur	do.	... „ „ 3 to	„ 5
Other charges	do.	...	„ 5
(2) Firewood—			
Felling and conversion	per 1,000 c. ft.	... from Rs. 5 to	Rs. 8
Carriage to river-bank	do.	... „ „ 8 to	„ 20
Carriage to railway station	do.	... „ „ 6 to	„ 18
Boating to Sukkur	do.	...	„ 5
(3) Charcoal—			
Felling and conversion	per 100 mds.	... from Rs. 24 to	Rs. 28
Carriage to river-bank	do.	... „ „ 2 to	„ 3
Boating to Sukkur	do.	... „ „ 5 to	„ 7
Other charges	do.	... „ „ 4½ to	„ 7

65. The several kinds of minor produce, grazing excepted, are sold yearly by public auction, for either each range separately or the whole division at once. Grazing is leased out departmentally to individual cattle-owners for two months at a time.

5.—Net price of each class of saleable produce.

66. In order to determine the net price it is necessary to know the expenditure incurred on the extraction of each class of saleable produce and to deduct it from the gross value, but this is not possible in the circumstance that the expenditure involves several items of account under conservancy and works and also establishments.

67. It will be useful and interesting to compare the average prices realised per acre for the coupes sold during the last 8 years, that is, from the time when the contract agency of exploitation of coupes was begun :—

Year.	Area exploited.	Value.	Price per acre.	Average for 8 years.
	Acres.	Rs.	Rs.	
1895-1896 ...	14,854	45,000	3·03	
1896-1897 ...	11,940	56,000	4·69	
1897-1898 ...	3,388	26,870	7·93	
1898-1899 ...	13,445	58,000	4·31	4·70
1899-1900 ...	13,460	50,000	3·76	
1900-1901 ...	11,389	41,501	3·64	
1901-1902 ...	10,833	45,400	4·19	
1902-1903 ...	8,831	53,703	6·08	

Viewed in the light of the rates paid by the railway per 1,000 c.ft. of stacked firewood the above average price indicates an average out-turn of something below 400 cubic feet per acre. The forests are certainly poor in most cases as the result of overcutting in the past, but whether this accounts for the low rates obtained or whether it is that the coupes have been sold too [illegible]ly without reference to their yield and the bulk of the profits has gone [illegible]he pockets of the contractors are questions which further experience [illegible] decide. The greatest difficulty in the way of obtaining better prices has [illegible]ably been the arrangement under which the supply of fuel to the railway has been regulated. The departmental system of working having been proved to be faulty the alternative of holding out for high rates involved the risk of delay of supplying wood to the railway. A middle course which suggests itself of employing contractors to only exploit the coupes and carry the material to the railway would yield a larger profit to the department in that it would obviate loss from under estimate of the contents of the coupes and leave clear royalty to be calculated on the out-turn, but it could be applied to only those coupes which would be worked for the railway, as it does not take into account the disposal of the surplus material and timber which, under present conditions, find their way to the market. It is possible that better prices can be got for the coupes even as they are worked at present if their actual contents are estimated more closely and small contractors are encouraged for single coupes.

68. The values realised on account of the different descriptions of minor produce are stated in appendix I; and the rates of grazing fees charged are also quoted in the same appendix.

CHAPTER V.

MISCELLANEOUS FACTS.

1.—*The forest staff.*

69. The following shows the numerical strength, distribution and rates